Cisco DSL Router Configuration and Troubleshooting Guide

RFC1483 Pure Bridging – Troubleshooting

Determine the Layer to Troubleshoot

There are many reasons why your Digital Subscriber Line (DSL) connection may not be functioning properly. The goal of this section is to isolate the cause of the failure and repair it. The first troubleshooting step is to determine which layer of your Asymetric Digital Subscriber Line (ADSL) service is failing. There are three layers in which the failure can occur.

- Layer 1 – DSL physical connectivity to your ISP's Digital Subscriber Line Access Multiplexer (DSLAM)
- Layer 2.1 – ATM connectivity
- Layer 2.2 – Point–to–Point Protocol over ATM (PPPoA), Point–to–Point Protocol over Ethernet (PPPoE), RFC1483 Bridging, or RFC1483 Routing
- Layer 3 – IP

The easiest way to determine which layer you should begin troubleshooting is to issue the command **show ip interface brief**. The output of this command differs slightly depending on your configuration.

```
827-ESC#show ip interface brief
Interface    IP-Address    OK?    Method    Status     Protocol
ATM0         unassigned    YES    manual up          up
ATM0.1       unassigned    YES    unset   up          up
Ethernet0    10.10.10.1    YES    manual    up          up
```

If the statuses of ATM0 and ATM0.1 are up and the protocol is up, begin troubleshooting at Layer 2.

If the ATM interfaces are down, or if they keep coming up and then going down (they don't stay up), begin troubleshooting at Layer 1.

Layer 1 Issues

Is the carrier detect (CD) light on the front panel of the Cisco DSL Router on or off?

If the CD light is on, go to the Layer 2 Issues section of this document.

If the CD light is off, continue with the next question.

Is your ISP using a DSLAM that supports the Alcatel chipset?

Verify this information with your ISP.

Is the DSL port on the back of the Cisco DSL Router plugged into the DSL wall jack?

If the DSL port is not plugged into the DSL wall jack, connect the port to the wall with a 4–pin or 6–pin RJ–11 cable. This is a standard telephone cable.

Is the ATM interface in an `administratively down` state?

To determine if the ATM0 interface is administratively down, issue the following command in *enable* mode on the router:

```
Router#show interface atm 0
ATM0 is administratively down, line protocol is down
<... snipped ...>
```

If the ATM0 interface status is administratively down, issue the **no shutdown** command under the ATM0 interface.

```
Router#configigure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface atm 0
Router(config-if)#no shut
Router(config-if)#end
Router#write memory
```

Is the cable pinout correct?

If the ATM0 interface status is down and down, the router is not seeing a carrier on the ADSL line. This generally indicates one of two issues:

1. The active pins on the DSL wall jack are incorrect.
2. Your ISP has not turned up a DSL service on this wall jack.

Cisco DSL Router xDSL Port Pinouts

The RJ–11 connector provides an xDSL connection to external media via a standard RJ–11 6–pin modular jack.

Pin	Description
3	XDSL_Tip
4	XDSL_Ring

To determine if the ATM0 interface is down and down, issue the **show interface atm 0** command from *enable* mode of the router.

```
Router#show interface atm 0
ATM0 is down, line protocol is down
<... snipped ...>
```

If the ATM interface is down and down—*not* administratively down—check the pinout of your DSL wall jack. The DSL Router uses a standard RJ–11 (4–pin or 6–pin) cable to provide the ADSL connection to the wall jack. The center pair of pins on the RJ–11 cable is used to carry the ADSL signal (pins 3 and 4 on a

6–pin cable, or pins 2 and 3 on a 4– pin cable).

If you are sure you have the right pins on the wall jack and the ATM0 interface is still down and down, replace the RJ–11 cable between the DSL port and your wall jack. If the interface is still down and down after replacing the RJ–11 cable, contact your ISP and have the ISP verify that DSL service has been enabled on the wall jack you are using.

If you are not sure what pins on your wall jack are active, ask your ISP.

Do you have the correct power supply for the Cisco 827?

If you have verified that your ADSL cable is good and that you have the correct pinouts, the next step is to make sure you have the correct power supply for the 827.

Note: The 827 does not use the same power supply as other 800 series routers.

To determine if you have the correct power supply, on the back of the power adapter look for **Output +12V 0.1A, −12V 0.1A, +5V 3A, −24V 0.12A, and −71V 0.12A**. If your power supply is missing the +12V and −12V feeds, then it is for a different Cisco 800 series router and will not work on the 827. Note that if you use the wrong power supply, the Cisco 827 will power up but will be unable to train up (connect) to the ISP DSLAM.

Is the DSL operating–mode correct?

If everything up to this point in the Layer 1 troubleshooting procedure is correct, the next step is to make sure you have the correct DSL operating mode. Cisco recommends using **dsl operating–mode auto** if you are not sure what DMT technology your ISP is using. The commands to configure operating–mode autodetection are as follows:

```
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#interface atm 0
Router(config-if)#dsl operating-mode auto
Router(config-if)#end
Router#write memory
```

Is the circuit tested/provisioned correctly?

Obtain this information from your ISP or telephone company.

Layer 2 Issues

Do you have the correct Permanent Virtual Circuit (PVC) values (VPI/VCI)?

Complete the following steps to determine whether you have the correct virtual path identifier/virtual circuit identifier (VPI/VCI) values configured on the router.

1. Verify your version of Cisco IOS® software.

   Important: This will not work with Cisco IOS Software Release 12.1(1)XB.

```
Router#show version
!--- Used to determine your Cisco IOS version.

Cisco Internetwork Operating System Software
IOS (tm) C820 Software (C820-OSY656I-M), Version 12.1(3)XG3,
EARLY DEPLOYMENT RELEASE SOFTWARE (fc1)
!--- The two lines immediately preceding appear on one line on the router.
TAC:Home:SW:IOS:Specials for info
Copyright (c) 1986-2000 by cisco Systems, Inc.
Compiled Wed 20-Dec-00 16:44 by detang
Image text-base: 0x80013170, data-base: 0x80725044
<... snipped ...>
```

2. Configure the router for *debug* logging.

```
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#logging console
Router(config)#logging buffer
Router(config)#service timestamp debug datetime msec
Router(config)#service timestamp log datetime msec
Router(config)#end
Router#write memory
Building configuration...
[OK]
Router#terminal monitor
```

3. Enable debugging on the router.

```
Router#debug atm events
ATM events debugging is on
Router#
2d18h:
2d18h: RX interrupt: conid = 0, rxBd = 0x80C7EF74 length=52
2d18h: Data Cell received on vpi = 8 vci = 35
!--- Your VPI/VCI.
2d18h:
2d18h: RX interrupt: conid = 0, rxBd = 0x80C7EEC0 length=52
2d18h: Data Cell received on vpi = 8 vci = 35
2d18h:
2d18h: RX interrupt: conid = 0, rxBd = 0x80C7EECC length=52
2d18h: Data Cell received on vpi = 8 vci = 35
2d18h:
2d18h: RX interrupt: conid = 0, rxBd = 0x80C7EED8 length=52
2d18h: Data Cell received on vpi = 8 vci = 35
```

4. Make sure you have **debug ATM events** running on the Cisco DSL Router, and then go to a working Internet connection and begin to ping the IP address your ISP statically assigned to you.

It does not matter whether you have configured this IP address on the Cisco DSL Router. What is important is that your ATM interface is up/up and that you are pinging the IP address your ISP gave you. If you don't see the expected output after the ping test, contact your ISP for support.

5. Disable debugging on the router.

<< wait 60 seconds >>

```
Router#undebug all
!--- Used to turn off the debug events.

All possible debugging has been turned off.
```

Verify your VPI/VCI values, and then make the necessary changes to your configuration.

If you do not see output during the 60 seconds of debugging, contact your ISP.

Can you ping the default gateway from your PC?

In a bridged environment, pinging the default gateway is a good test of connectivity. In general, if you can ping to your default gateway, you know that Layer 1 and Layer 2 services are functioning properly. Open an MS–DOS window and try to ping the default gateway.

```
C:\>ping 192.168.1.1

Pinging 192.168.1.1 with 32 bytes of data:
Reply from 192.168.1.1: bytes=32 time<10ms TTL=247
Reply from 192.168.1.1: bytes=32 time<10ms TTL=247
Reply from 192.168.1.1: bytes=32 time<10ms TTL=247
Reply from 192.168.1.1: bytes=32 time<10ms TTL=247
Ping statistics for 192.168.1.1:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

If your success rate is 80–100 percent, try to ping a valid Internet address (198.133.219.25 is www.cisco.com). If you can ping the default gateway from the PC but you cannot ping another Internet address, make sure you have only one static default route in the configuration (for example, IP route 0.0.0.0 0.0.0.0 192.168.1.1).

For the example above, if you already have a correct static default route and cannot ping Internet addresses, contact your ISP to resolve the routing issue.

If the ping test fails, you see output similar to the output shown below. In this case, continue with the troubleshooting steps that follow.

```
C:\>ping 192.168.1.1

Pinging 192.168.1.1 with 32 bytes of data:
Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 192.168.1.1:
Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Is the bridge port in a forwarding state?

For your Cisco DSL Router to forward packets to your ISP, your bridged interface must be in a forwarding state. If your bridged interface is in a blocking state, there is a loop in your network that you have to remove before you are able to pass traffic. The most common cause of a loop in a DSL network is having two bridged DSL circuits to the same ISP.

```
Router#show spanning-tree

 Bridge group 1 is executing the ieee compatible Spanning Tree protocol
  Bridge Identifier has priority 32768, address 0001.96a4.a8bc
```

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```
      Configured hello time 2, max age 20, forward delay 15
      Current root has priority 32768, address 0000.0c25.36f4
      Root port is 3 (ATM0), cost of root path is 1562
      Topology change flag not set, detected flag not set
      Number of topology changes 2 last change occurred 00:00:56 ago from Ethernet0
      Times:  hold 1, topology change 35, notification 2
              hello 2, max age 20, forward delay 15
      Timers: hello 0, topology change 0, notification 0, aging 300

    Port 2 (Ethernet0) of Bridge group 1 is forwarding
      Port path cost 100, Port priority 128, Port Identifier 128.2.
      Designated root has priority 32768, address 0000.0c25.36f4
      Designated bridge has priority 32768, address 0001.96a4.a8bc
      Designated port id is 128.2, designated path cost 1562
      Timers: message age 0, forward delay 0, hold 0
      Number of transitions to forwarding state: 1
      BPDU: sent 44, received 0

    Port 3 (ATM0) of Bridge group 1 is forwarding
      Port path cost 1562, Port priority 128, Port Identifier 128.3.
      Designated root has priority 32768, address 0000.0c25.36f4
      Designated bridge has priority 32768, address 0000.0c25.36f4
      Designated port id is 128.17, designated path cost 0
      Timers: message age 2, forward delay 0, hold 0
      Number of transitions to forwarding state: 1
      BPDU: sent 2, received 53

    Router#
```

Is there an entry in the bridge table?

When you are sure that your bridged interface is forwarding, you need to determine if you have the Layer 2 media access control (MAC) address of your ISP's gateway router. Use the **show bridge** command to check for the Layer 2 address. This command lists all the Layer 2 entries for a specific bridge group.

In the following example, there are two entries in the bridge table. The first entry is the MAC address of the PC client in the LAN. The second entry is the MAC address of the ISP's gateway router (default gateway). If the MAC address of the ISP's gateway router is not in the bridge table, contact your ISP to verify your network settings.

```
    Router#show bridge

    Total of 300 station blocks, 298 free
    Codes: P – permanent, S – self

    Bridge Group 1:
    Address         Action     Interface    Age    RX count    TX count
    0010.a492.e1d2  forward    Ethernet0    4           163           4
    0010.7bb9.bd1a  forward    ATM0         0             4           3

    Router#
```

Related Information

- **Cisco DSL Technology Support Information**
- **Cisco DSL Product Support Information**
- **Technical Support – Cisco Systems**

Contact the Cisco Technical Assistance Center

If you need additional assistance implementing RFC1483 pure bridging, contact the Cisco Technical Assistance Center (TAC).

Note: To use the Case Open tool to open a case online, you must be a registered user and you must be logged in.

Call the TAC

If you do not have a service contract with Cisco and need assistance implementing RFC1483 pure bridging, direct your web browser to Cisco's Warranty Status Tool.

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